

REMARKS

Applicant respectfully requests reconsideration of this application in view of the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in substantially the same order in which the corresponding issues were raised in the Office Action.

Status of the Claims

Claims 1, 3-4, 6-7, 9-10, 12-21, 23-24, 26-27, 29-31 are pending. Claims 1, 3-4, 6-7, 9-10, 18, 23-24, 26-27 are currently amended to more clearly define pre-existing claim limitations. Claims 2, 5, 8, 11, 22, 25, and 28 are canceled. No claims are added. No new matter has been added.

Summary of the Office Action

Claims 11 and 28 stand objected to as depending from a rejected independent claim, but would be allowable if rewritten in independent form to include all intervening claim limitations.

Claims 1-2, 5, 7, 10, 12, 14, 17, 27, 29 and 31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,687,812 to Shimada (hereinafter "Shimada")

Claims 6, 8-9, 13, and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimada.

Response to Objections

The drawings stand objected to because Figs. 5A and 5B have not been properly labeled as Prior Art. In particular, the Office Action states that the drawings depict nothing but configurations of prior art Intel systems. See Fig. 1 of Huff et al. (Patent No. 6,052,769) and Fig. 2 of Watson et al. (Patent No. 6,466,226). Applicant respectfully submits that Figures 5A and 5B have been amended to include fork predictor 500 and 501, and corresponding amendments have been made in the specification at paragraphs [0033] and [0035]. Support for the amendments is found in the detailed description and the claims of the specification, in particular paragraph [0032] and original claims 1-9, 18-

26, and 27-31, which indicate that the processor described in the detailed description support execution of speculative threads as described therein. Applicant respectfully requests that the objection to the drawings be withdrawn.

Response to Rejections under 35 U.S.C. § 102(e)

The Office Action rejected claims 1-2, 5, 7, 10, 12, 14, 17, 27, 29 and 31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Shimada. Applicant respectfully requests withdrawal of these rejections because the cited reference fails to disclose all of the limitations of the claims.

CLAIMS 1, 3-4, 6-7, and 9

Claim 1 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Shimada. Applicant respectfully submits that claim 1 is patentable over the cited reference because Shimada does not disclose all of the limitations of the claim. Claim 1, as amended, recites:

A processor, comprising:
a fork predictor to issue a prediction whether a fork instruction should be permitted to execute, wherein said fork predictor includes a prediction logic to issue said prediction based upon execution history of speculative threads, wherein said fork predictor includes an update logic to receive a first calculated determination whether a first one of said speculative threads was executed desirably, and **wherein said first calculated determination is performed by executing an update instruction;** and
an execution unit to execute said fork instruction responsive to said prediction. (emphasis added)

Applicant respectfully submit that first calculated determination of whether a first speculative thread was executed desirably is performed by executing an update instruction. Shimada fails to disclose at least this limitation of the claim.

Shimada is directed to a parallel processing apparatus for efficiently executing a fork instruction for activating a plurality of processors. See Shimada, Abstract. The fork-instruction predicting section of Shimada includes a predicting section for predicting whether or not the fork condition of a fork-conditioned fork instruction is satisfied after fetching but before executing the instruction. See Abstract. Shimada does not disclose

predicting whether or not the fork condition of the fork instruction was satisfied by executing an update instruction, as required by the claim.

The Office action stated that “[i]t is unclear whether Shimada uses merely a hardware device or an instruction or a microcode-implemented instruction to make the determination.” Applicants respectfully disagree with this assertion. Shimada discloses that each instruction is executed in separate pipeline stages called instruction fetching (IF), instruction decoding (ID), instruction execution (EX), memory access (MEM) and write back (WB). See col. 1, lines 38-41. As illustrated and described with respect to Figures 4, 7 and 9, the upon determination of whether the forking of the thread should be predictor or not during the instruction decoding (ID) stage of the pipeline, subsequently during the instruction execution (EX) stage, the instructions are executed to perform some of the following operations: inform cancellation/establishment of fork thread, update history of information, send forking destination address to external PE, and merely execute the instruction. See ID and EX stages of Figure 4. This shows that determination of whether the speculative thread was executed desirably is not performed by an update instruction, *because the determination and execution of such determination are made during the instruction decoding (ID) and execution (EX) stages of the initial fork instruction read from cache, and not a separate update instruction.* Thus, it is clear that Shimada discloses that the determination is made by decoding the fork instruction in the ID and EX stages of the pipeline (e.g., hardware device), and does not perform the determination by executing an update instruction, as required by the claim.

Moreover, Shimada also discloses that when the result of a decision from the instruction executing section, the result of the decision is input to the history-information update section. The history-information update section updates the history information of the predicted instruction and writes back the updated history information in the history buffer. This similarly shows that Shimada clearly uses a hardware device, and not an instruction to execute the update to the history information.

Despite the fact that Shimada clearly discloses using a hardware device, and not an instruction to make the determination, the Office action took Official notice, stating that “the model of using an instruction to determine whether a speculative branch-type of instruction such as a speculative fork instruction executed desirably is an old and

conventional technique in the art.” See Office action, mailed June 14, 2006, page 6. However, even assuming that this assertion is true, combining the teachings of the reference and the Official notice, would lead to an inoperable device, since Shimada clearly discloses a hardware device (e.g., pipeline stages and history-information update section) to make the determination and to perform the update to the history information. Consequently, the combination of the reference and the Official notice do not disclose the limitation of performing the first calculated determination by executing an update instruction, as required by the claim.

Given that the cited reference fails to disclose all of the limitations of the claim, Applicant respectfully submits that claim 1 is patentable over the cited reference. Accordingly, Applicant requests that the rejection of claim 1 under 35 U.S.C. § 102(e) be withdrawn.

Given that claims 3-4, 6-7, and 9 depend from independent claim 1, which is patentable over the cited reference, Applicant respectfully submits that dependent claims 3-4, 6-7, and 9 are also patentable over the cited reference. Accordingly, Applicant requests that the rejection of claims 5, and 7 under 35 U.S.C. § 102(e) and the rejection of claims 3, 4, 6, 8 and 9 under 35 U.S.C. § 103(a) be withdrawn.

CLAIMS 10, 12-17

Claim 10 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Shimada. Applicant respectfully submits that claim 10, which has been amended to include the limitation of claim 11, which the Office action has objected to as being dependent upon a rejected base claim, is patentable over the cited reference. Accordingly, Applicant requests that the rejection of claim 10 under 35 U.S.C. § 102(e) be withdrawn.

Given that claims 12-17 depend from independent claim 10, which is patentable over the cited reference, Applicant respectfully submits that dependent claims 12-17 are also patentable over the cited reference. Accordingly, Applicant requests that the rejection of claims 12, 14 and 17 under 35 U.S.C. § 102(e) and the rejection of claims 13, and 15-16 under 35 U.S.C. § 103(a) be withdrawn.

CLAIMS 18, 19-21, 23-24, and 26

Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimada in view of applicants' specification. Applicant respectfully submits that claim 18 is patentable over the cited reference for reasons similar to those described above with respect to claim 1. Given that the cited references fail to teach or suggest all of the limitations of the claim, Applicant respectfully submits that claim 18 is patentable over the cited references. Accordingly, Applicant requests that the rejection of claim 18 under 35 U.S.C. § 103(a) be withdrawn.

Given that claims 19-21, 23-24, and 26 depend from independent claim 18, which is patentable over the cited references, Applicant respectfully submits that dependent claims 19-21, 23-24, and 26 are also patentable over the cited references. Accordingly, Applicant requests that the rejection of claims 19-21, 23-24, and 26 under 35 U.S.C. § 103(a) be withdrawn.

CLAIMS 27, and 29-31

Claim 27 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Shimada. Applicant respectfully submits that claim 27 is patentable over the cited reference for reasons similar to those described above with respect to claim 1. Given that the cited reference fails to disclose all of the limitations of the claim, Applicant respectfully submits that claim 27 is patentable over the cited reference. Accordingly, Applicant requests that the rejection of claim 27 under 35 U.S.C. § 102(e) be withdrawn.

Given that claims 29-31 depend from independent claim 27, which is patentable over the cited reference, Applicant respectfully submits that dependent claims 29-31 are also patentable over the cited reference. Accordingly, Applicant requests that the rejection of claims 29 and 31 under 35 U.S.C. § 102(e) and the rejection of claim 30 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

It is respectfully submitted that in view of the amendments and remarks set forth herein, the rejections and objections have been overcome. If the Examiner believes a telephone interview would expedite the prosecution of this application, the Examiner is invited to contact Michael J. Mallie at (408) 720-8300.

If there are any additional charges, please charge them to Deposit Account No. 02-2666.

Respectfully submitted,

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Amendments to the Drawings:

The attached drawing sheet(s) include changes to Figure(s) 5A and 5B. In Figure 5A and 5b, fork predictors 500 and 501 have been included. Support for the amendment is found in the specification. No new matter has been added.